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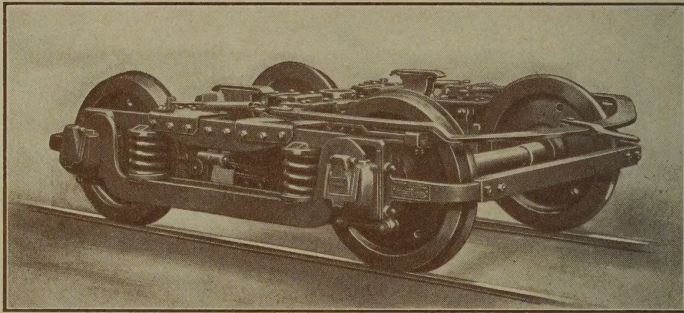
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SEPTEMBER, 1910

No. 9

BRILL MAGAZINE



Monument Square
Cleveland, Ohio



No. 27-M. C. B. HIGH SPEED TRUCK

In high speed service a truck receives shocks strains and vibrations which are acknowledged to be severe but whose magnitude it is impossible to determine because of their nature. For that reason every Brill No. 27-M. C. B. truck is designed and built with a safety factor of six. As an additional safeguard there is the solid forged side frame construction which eliminates those weaknesses and dangers which are inherent in castings and built-up work. Solid forged means safety and long life. Compare the frame of the Brill No. 27-M. C. B. with the frame of any other high speed truck for rivets in shear and see what the one-piece forging secures.

THE J. G. BRILL COMPANY
PHILADELPHIA - - - PENNSYLVANIA

BRILL MAGAZINE

Vol. IV

SEPTEMBER, 1910

No. 9

JOHN M. ROACH

[WITH PORTRAIT INSERT]

JOHN M. ROACH, president of the Chicago Railways Company and managing receiver of the Consolidated Traction Company of Chicago, was born in 1852 in Jackson County, Ohio, of Scotch-Irish stock which originally settled in Virginia. He came to DeKalb, Illinois, with his parents at the age of ten years. Five years later he returned to Ohio, to enter college at Beverly, where he spent two years, after which he went to Helena, Montana, where he did newspaper work for a while and also became interested in mining propositions. From Helena he went on horseback to Walla Walla, Washington; Portland, Oregon, and down the Pacific Coast to Los Angeles, from which point he turned east and rode to Salt Lake City. Still unsatisfied with the outlook he went to Chicago where some friends advised him to enter the street railroad business. Accepting the suggestion, Mr. Roach entered the employ of the old North Chicago Street Railroad as a conductor in 1872. He served in that capacity for six months and perhaps it was because he turned in more fares than any other conductor that the officials made him cashier. In 1879 he had been promoted to the position of purchasing agent; in 1890 he was superintendent of the road, and three years later had attained the position of second vice president and general manager of the company. In 1897 he was elected vice president and general manager of the West Chicago Street Railroad Company. Two years later Mr. Roach was chosen vice president of the Union Traction Company and when that corporation under the new order of things became the Chicago Railways Company in 1908, Mr. Roach was elected president and general manager. Under his charge are over 500 miles of the busiest surface car lines in this country which daily carry more than 1,200,000 passengers and operate under a partnership agreement with the city of Chicago.

CONDITIONS WHICH GOVERN THE TYPE OF CAR FOR CITY SERVICE

CLEVELAND, OHIO*

TRACTION affairs in Cleveland have been in such a chaotic state for the past two years that, while new rolling stock has been added to the equipment of the traction company, it has been impossible to distinguish whether the influences affecting the design were due to normal conditions or were the result of the complex circumstances arising from the so-called attempt at municipal operation. With the present more stable conditions, it is now possible to consider both the cause and effect of the principal features of the cars in question.

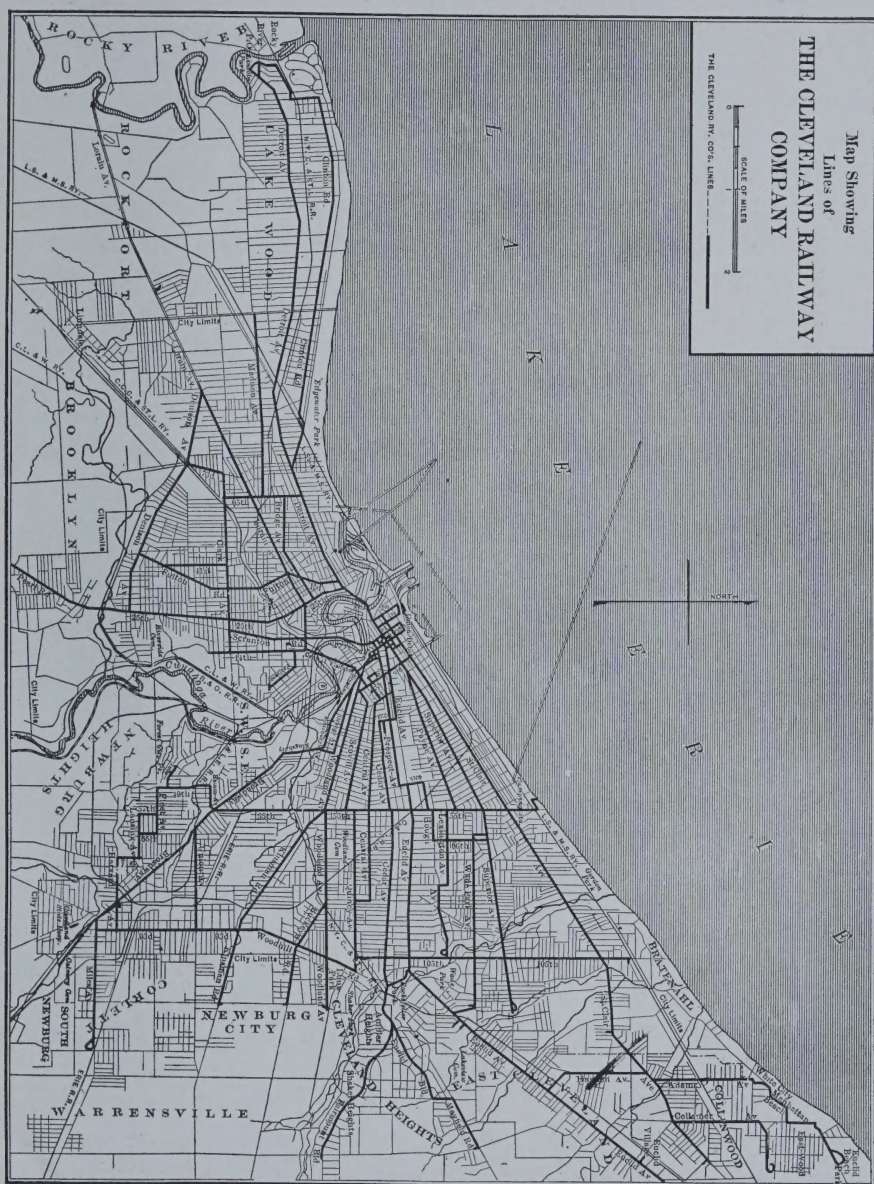
The new cars, of which 25 were built and delivered by the G. C. Kuhlman Car Company, early this year, have attracted much attention in this country and abroad because of their exceptional length, the figures for the principal dimensions being as follows:—

Length of car body over corner posts	36 ft. 0 in.
Length of front vestibule	7 ft. 2½ in.
Length of rear vestibule	7 ft. 11½ in.
Length of car over buffers	52 ft. 0 in.
Width over sills	8 ft. 1 in.
Width over posts	8 ft. 2 in.
Height bottom of sill over roof	8 ft. 6 in.
Bolster centers	24 ft. 0 in.
Minimum radius track curve	30 ft. 0 in.

The details of truck and electrical equipment and the figures for the weight of the cars are as follows:—

Trucks	Brill No. 27-G1
Motors	4 West 40 h. p.
Weight	
Car body	24,340 lb.
Motors	12,500 lb.
Trucks	11,260 lb.
Total	48,100 lb.

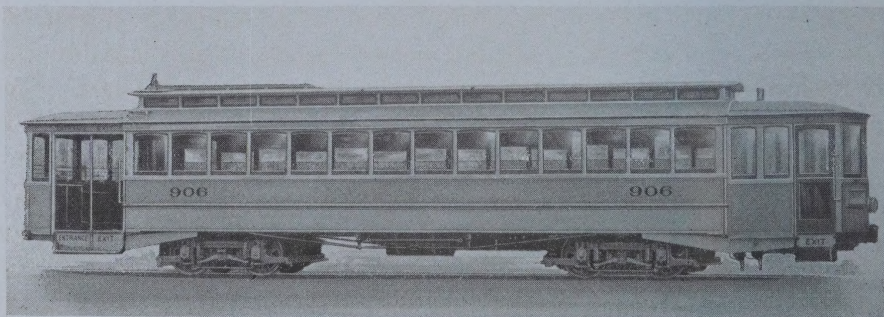
* This is the twenty-first in a series of articles, each of which discusses the tramway system of some important city of the world with particular reference to the type of car which is used.



CONDITIONS WHICH GOVERN THE TYPE OF CAR FOR CITY SERVICE—Cleveland Has A Population of 560,663 and 245 Miles of Electric Railway Track—It is Also Served by Several Interurban Electric Railways—Map Reproduced from American Street Railway Investments By Courtesy McGraw Publishing Company

The cars are generally considered the largest thus far built for strictly city service and all available records seem to bear out this contention. A study of the operation of the Municipal Traction Company discloses the reason for their exceptional size, for it must be borne in mind that the cars were ordered before the Cleveland traction properties were returned to the Cleveland Railway Company.

Control of the Cleveland Electric Railway Company was secured by the Municipal Traction Company under a lease dated April 27, 1908. During the six and a half months from that time to November 12, 1908, when receivers were appointed, although the reputed municipal management had various plans and made various efforts for



CONDITIONS WHICH GOVERN THE TYPE OF CAR FOR CITY SERVICE—This Cleveland Car of Which Twenty-five Are In Operation Is Said to be the Longest City Car in Regular Service
Length 52 ft. Over Bumpers—Mounted on Brill No. 27-G Trucks

the development and betterment of the property, its principal efforts were in the direction of cheapening the cost of operation. That this was imperatively necessary appears to have been due to a number of circumstances, but primarily to the fact that the terms of the lease provided that the Municipal Traction Company should pay to the Cleveland Electric Railway Company 6 per cent. annually, in quarterly installments of $1\frac{1}{4}$ per cent., upon \$14,675,600. of capital stock of the Railway Company as well as all legal debts except the outstanding bond issues and floating debt and accident and certain other liabilities. Failure to pay the annual rental each quarter involved forfeiture of the lease after two payments had been passed and installments in arrears bore interest at the rate of 8 per cent. These requirements coupled with an effort to give 3-cent fares with universal transfers, a campaign

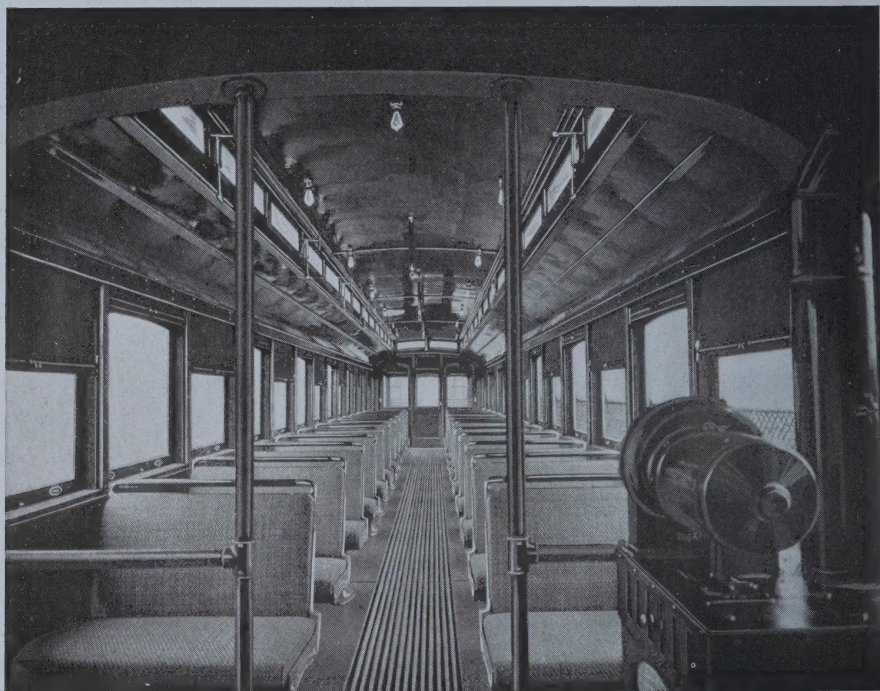
understanding which was not complied with, and management in some respects diametrically opposed to American standard practice, which was either the result of inexperience or poor organization and which caused a decrease in the number of passengers carried as well as a decrease in receipts, necessitated radical efforts towards economy.

It is not possible to take up in detail the various means used to cheapen the cost of operation, but it is quite apparent that the large cars were in many ways the result of an effort to reduce car mileage. The Municipal Traction Company adopted a plan of operating fewer cars at all hours of the day and of running them at higher speed. Fewer cars meant a smaller charge for wages and the lessened car mileage meant a lessened charge for maintenance, the terms of the lease providing a maintenance charge based on car mileage. The fewer number of cars operated resulted in many complaints both regarding the infrequency of the service and the crowded condition of the cars. The management of the Municipal Traction Company, of which A. B. duPont was president, was not insensible to these criticisms. Doubtless Mr. duPont believed that the difficulty could be relieved by larger cars and as the specifications for the cars described above were drawn while he was advisor and consulting engineer for the receiver of the Municipal Traction Company, it is reasonable to suppose that the experience of the Municipal Traction Company at least had some influence in the decision to make the cars as large as possible.

Observation of the operation of the large Cleveland cars at present discloses the fact that except during rush hours there is little crowding. This condition may be partially accounted for by the fact that the Cleveland Railway Company has restored a large number of cars which were removed from service by the Municipal Traction Company, as well as by the fact that the size of the cars relieves crowding. However, it is interesting to note that when the travel is very heavy as during the rush hours, a time when heavily loaded cars are to be expected, it is practically impossible to load the cars to capacity.

With the Pay-Enter system, as it is called in Cleveland, it is impossible for the conductor to force passengers standing in the aisle to move up towards the front of the car in spite of an effort to establish a "leave by the front" practice. This difficulty, which is a weakness of the size of the cars rather than of the prepayment system, results in

a condition which makes it impossible at times for passengers to board the car at the rear, as they necessarily must, even though there is a large amount of standing room in the front of the car. The Cleveland Railway Company is now employing efficient inspectors and at certain times it is not unusual to see these men making vigorous efforts to load the cars to capacity by climbing partially through the windows and per-



CONDITIONS WHICH GOVERN THE TYPE OF CAR FOR CITY SERVICE—The Forced Circulation Heater in the Foreground is Located on the Front Platform and in Summer is Removed to Increase the Seating Capacity—There Are Five Platform Seats

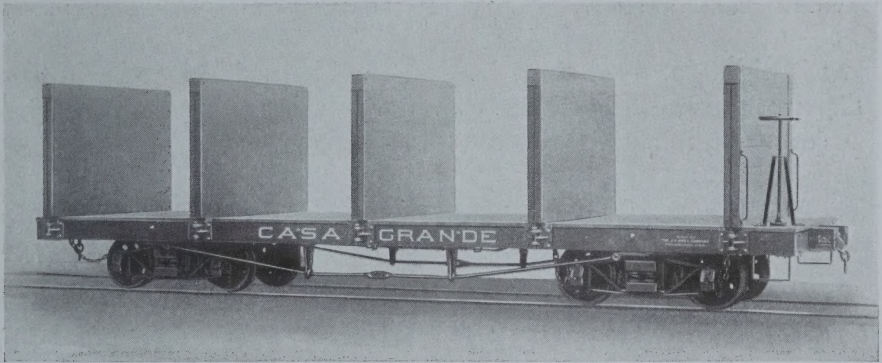
sonally requesting passengers in the center of the car to move up towards the front in order to allow others to board the car.

This is only one feature of the Cleveland cars. Lack of space prohibits the consideration of others, such as the prepayment system; the forced circulation ventilation system, which has successfully heated and ventilated the large Cleveland cars in winter; the long platforms; the unusual seating arrangement.

PLANTATION EQUIPMENT FOR PERU

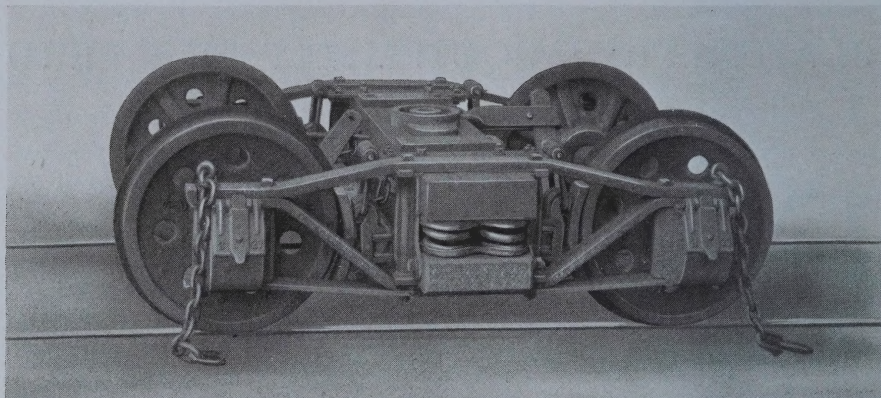
CANE CARS

FIFTY sugar cane cars were shipped from the plant of The J. G. Brill Company during August and will be placed in service in Peru in time for use this season. The cars, which are virtually platform cars for narrow gauge track, have five bulkheads 4 ft. 6 in. high extending across the car and dividing each car into four compartments. The bulkheads are spaced 5 ft. 6 in.



PLANTATION EQUIPMENT FOR PERU—Each Car is 26 ft. 1 in. Long Over End Sills—The Bulkheads are Plated With Steel to Facilitate Unloading of the Sugar Cane

apart and are 5 in. thick. They are of solid construction and are plated with $\frac{3}{16}$ -in. steel on each side, with the exception of the end compartment walls which are plated on the inside only. Each car is 26 ft. 1 in. long over end sills and 6 ft. 6 in. wide over side sills. The carrying capacity is 14 tons. At one end of each car there is a short platform on which is a brake shaft with horizontal iron brake wheel. Both ends of the car have cast iron buffers, a draw bar hook and coupling link. The height from top of rail to center of coupler is 23 in. The cars are mounted on Brill trucks No. 55-D which are the diamond frame arch bar type with wood bolster and spring plank and spiral bolster springs arranged in nests of four at each end of the bolster. These trucks have a 4-ft. wheel base, 22-in. cast chilled iron



PLANTATION EQUIPMENT FOR PERU—Brill Truck No. 55-D Used Under the Cars—The Wheel Base is 48 in. and the Track Gauge 36 in.

wheels with 3-in. tread and 1-in. flange and journals 3 by 6 in. in size. The trucks are designed for use on 36-in. gauge track which has curves with minimum radius of 80 ft.



CAFE-CHAIR CAR SERVICE OF THE CHICAGO & MILWAUKEE ELECTRIC RAILROAD NEW CAR EQUIPMENT

IN addition to the cars for the Chicago & Milwaukee Electric Railroad which were described in the July number of Brill Magazine, the American Car Company built a cafe-chair car which is shown in accompanying engravings. The addition of this car gives the railroad four of the type which are operated in connection with eight daily three-car limited trains each of which carries one of the cafe-chair cars. The fare from Milwaukee to Evanston, a suburb of Chicago, where connection is made with the Northwestern Elevated Railroad running into the heart of the city, is \$1.35 which

includes twenty-five cents excess fare for the limited service and covers the cafe car privilege, charge being made only for the food which is served. The regular fare on the Chicago & Northwestern Railway, the paralleling steam line, from Milwaukee to Evanston is \$1.46. The distance is 73 miles.

As an indication of the success of the limited train service, Mr. E. E. Downs, general manager for the receivers of the property, advises



CAFE-CHAIR CAR SERVICE OF THE CHICAGO & MILWAUKEE ELECTRIC RAILROAD—One of the Cars in Front of a Station Typical of Those at the More Important Points Along the Line

that during the month of July, 30,964 revenue passengers were carried on the trains in question, or an average of 125 revenue passengers per train per day. The cafe service is not operated at a profit but has practically carried itself. The accompanying menu card shows the wide variety of dishes which may be had and the reasonable prices. A fairly extensive stock of bottled wines and liquors is also carried which are to be had at proportionate prices.

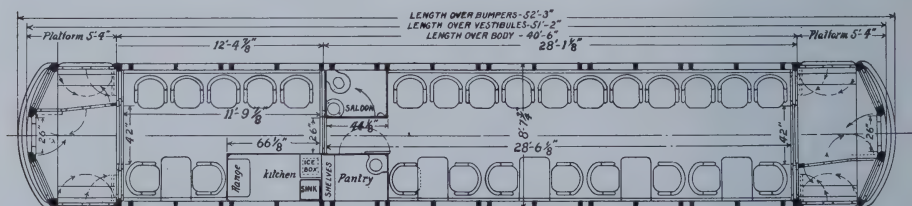
A plan of one of the cars is presented herewith. The chairs are of green wicker design with leather cushions and leather padded backs and arms. The maximum seating capacity of these upholstered chairs is 29 with no tables set up. When tables are set up it is desirable to move two or three chairs to the vestibule or off the car entirely. When an extra large load is carried the wicker



CAFE-CHAIR CAR SERVICE OF THE CHICAGO & MILWAUKEE ELECTRIC RAILROAD—Interior of Compartment for Non-Smokers—Portable Tables Can Be Set Up Between Chairs

seats are supplemented with six or eight folding camp chairs. The tables are of the ordinary dining-car type with the single folding leg, table hooks and wall plates. These table tops measure 22 in. x 32 in. and a raised bead around the edge, $\frac{1}{4}$ in. wide and $\frac{1}{8}$ in. high, prevents the slipping of the tablecloth. Two persons can very comfortably be served at a table of this size.

The car arrangement shown in plan with a row of tables down one



CAFE-CHAIR CAR SERVICE OF THE CHICAGO & MILWAUKEE ELECTRIC RAILROAD—Floor Plan—The Motorman's Cab Folds Compactly so that the Vestibule Can Be Used for Observation Purposes

A LA CARTE

As each order is specially prepared, guests will be served more promptly if orders are given to waiters as far in advance as possible.

SOUPS

Tomato 20c Vegetable 20c Chicken 20c Clam Chowder 25c
Clam Broth 20c

RELISHES

Olives 15c Pickles (Sweet) 15c Sliced Tomatoes 25c
Head Lettuce, French Dressing 25c

ENTREES

Chicken Tamale 40c Braised Beef a la Jardiniere 50c Chili Con Carne 30c
Chicken Saute 50c
Corned Beef Hash 40c Vienna Sausage 30c

GRILLED

Sirloin Steak 75c Lamb Chops (2) 50c Tenderloin Steak 65c
Broiled Young Chicken, Half 65c
Armour's Star Ham or Bacon 50c; with two fried eggs 60c

COLD DISHES

Ham or Ox Tongue 45c Baked Beans, hot or cold 25c
Columbia River Salmon 35c Imported Sardines 35c
Fried Egg, Ham, Tongue or Cheese Sandwich 15c

VEGETABLES

Stewed Tomatoes 15c Stewed Corn 15c June Peas 15c
Potatoes, German Fried 10c Hashed Brown 15c

EGGS

Fried or Scrambled 20c

OMELETTES

Plain 30c, With Chopped Ham or Parsley 40c
Scrambled Eggs, With Minced Ham on Toast 50c

BREADS

Parker House Rolls 10c Vienna 10c Graham 10c
Bread and Milk 20c Home Made Pie 10c Maple Flakes 20c

PRESERVED FRUITS IN GLASS

Figs, Strawberries, Cherries, Raspberries, Plums 25c
Berries in Season 25c Cantaloupe on Ice 25c

CHEESE

Canadian or American Cheese With Crackers 20c

TEA, COFFEE, ETC.

Cocoa 15c Tea or Coffee, Per Cup 10c Pot of Coffee 15c
Horlick's Malted Milk 15c Milk 10c Ice Tea or Coffee 15c

Bread and butter served with individual meal checks amounting to 40 cents and over.
No order less than 25 cents to each person.

side and a row of chairs down the other is merely to illustrate table and chair capacity of car. Ordinarily five tables are set up, one in the smoking compartment and four in the main compartment, the two pair farthest away from the observation end.

The motorman's cab is of such design that it may be folded in to a very compact shape and the vestibule used as an observation end for seated passengers.

The kit-

chen equipment includes a range consisting of broiler, coffee urn, cooker and hot-water tanks. Surmounting these is a sheet-steel hot-dish closet. The broiler portion is equipped with two alcohol burners, which are located under corrugated iron broiler plates $8\frac{3}{4}$ in. x $12\frac{1}{2}$ in. in size each. The daily consumption of alcohol fuel is 1 gal. to $1\frac{1}{2}$ gal. per day. It is possible for this broiler to broil a chop satisfactorily in about six minutes. On the side of the range opposite the broiler is a cooker tank for cooking and warming soups, etc., and in the back is a tank which holds clean hot water used for such purposes as making tea, etc. In the front on the extreme right is a $1\frac{1}{2}$ -gal. coffee urn. Under the broiler plates is a tin box or can to collect the grease from broiled meats.

A detailed list of china, glassware, silver, linen and other equipment for one car follows:

LINEN

- | | | |
|----------------------------------|----------------------|--------------------------------------|
| 36 table cloths, 36 in. x 45 in. | 12 waiter's aprons. | 2 blue aprons. |
| 72 table tops, 23 in. x 35 in. | 6 cook's aprons. | 12 table felts. |
| 168 napkins, 20 in. x 20 in. | 12 waiter's jackets. | 2 small meat cloths, 18 in. x 36 in. |
| 36 dish towels. | 6 cook's jackets. | 2 wrappers, 56 in. x 72 in. |
| 36 glass towels. | 2 blue jackets. | |

KITCHEN UTENSILS

- | | | |
|-------------------------|------------------------------|--------------------------|
| 3 egg fry pans. | 1 4-qt. improved coffee pot. | 1 8-qt. galvanized pail. |
| 1 fry pan. | 2 dredge boxes. | 1 broiler scraper. |
| 2 small egg whips. | 2 12-in. basting spoons. | 1 weight, 2 in. x 4 in. |
| 2 vegetable ladles. | 4 14-in. basting spoons. | 1 weight, 2 in. x 5 in. |
| 3 aluminum saucepans. | 2 potato knives. | 3 1-qt. crock. |
| 1 aluminum saucepan. | 1 cook's fork. | 1 2-qt. crock. |
| 2 meat platters. | 1 bread board. | 1 pudding pan. |
| 1 improved rice boiler. | 2 scrub brushes. | |

CHINA

- | | | |
|--------------------|---------------------------|-----------------------------|
| 30 8-in. plates. | 24 coffee saucers. | 6 after-dinner saucers. |
| 18 butter chips. | 8 small vegetable bakers. | 4 holder egg cups. |
| 6 soup plates. | 8 sauce dishes. | 3 cocoa pots. |
| 6 small platters. | 2 mustard pots. | 4 fancy finger bowl plates. |
| 15 large platters. | 3 celery trays. | 6 bean pots. |
| 24 coffee cups. | 6 after-dinner cups. | |

GLASSWARE

- | | | |
|--------------------|-----------------------|----------------------------|
| 18 water glasses. | 6 straight champagne. | 6 pepper shakers. |
| 12 beer glasses. | 2 vinegar bottles. | 6 ale glasses. |
| 6 whiskey glasses. | 2 water bottles. | 2 toothpick holders, 594A. |
| 6 claret glasses. | 5 salt shakers. | |

SILVERWARE

- | | | |
|-------------------------------|-------------------------|---------------------------------|
| 18 knives. | 6 oyster forks. | 2 loaf sugar bowls. |
| 18 medium forks. | 4 white-handled knives. | 2 powdered sugar bowls. |
| 36 tea spoons. | 2 silver tongs. | 1 cash tray. |
| 12 dessert spoons. | 1 ginger ale holder. | 2 silver hinged-cover creamers. |
| 6 after-dinner coffee spoons. | | |

MISCELLANEOUS

- | | | |
|-------------------------|--------------------|--------------------|
| 4 brass finger bowls. | 1 bar spoon. | 1 steel. |
| 2 2-cup tea pots. | 2 rubber stoppers. | 1 ice scoop. |
| 4 independent tea pots. | 4 tea strainers. | 1 silver brush. |
| 2 nickel coffee pots. | 1 ice pick. | 1 paste brush. |
| 2 aluminum trays. | 1 ice shaver. | 1 keeler. |
| 1 knife board. | 1 can opener. | 1 2-qt. cream can. |
| 1 cork puller. | 2 mustard spoons. | 1 1-qt. cream can. |
| 1 bar strainer. | 1 ham knife. | 1 small cleaver. |
| 2 bar towel hangers. | 1 bread knife. | |

CARS FOR THE LEHIGH VALLEY TRANSIT COMPANY

CONVERTIBLE TYPE

A NUMBER of roads have added to their equipment cars of the convertible type adopted as standard by the Third Avenue Railroad of New York City. Among these is the Lehigh Valley Transit Company to whom The J. G. Brill Company recently delivered ten Pay-As-You-Enter cars of the type shown in the accompanying engravings. The following is a table of the principal dimensions:

Length of car body over corner posts	30 ft. 1 in.
Length of each platform	5 ft. 10 in.
Length of car over vestibules	41 ft. 9 in.
Length of car over bumpers	43 ft. 1 in.
Length of car at sills including plates	8 ft. 8 in.
Width of car over posts	8 ft. 8 in.
Weight, car and trucks with air brakes and electrical equipment and including removable panels	49,420 lb.

The feature of the cars is the removable panels reaching from the top of the sill plate to the letter board. There are nine of these panels on each side of the car and two fixed panels at the corners of the car which are made of steel and are fitted with plate glass windows. The removable panels also have plate glass windows, which, unlike some of



CARS FOR THE LEHIGH VALLEY TRANSIT COMPANY—One of the Cars With Panels Removed and Screens in Place—The trucks Are Brill No. 27-M, C. B., for High Speed Service

the previous convertible cars of the type, can not be opened. When the panels are removed in order to place the cars in summer service, sectional screens are placed between posts and these extend from the top of the sill plate to a height 44 in. from the floor. As a part of the removable panel construction the side sills, which are long leaf yellow pine 4-½ by 7 in., are plated with 14 in. by $\frac{9}{16}$ -in. steel plate. The plate extends above the level of the floor.



CARS FOR THE LEHIGH VALLEY TRANSIT COMPANY—Interior View Showing the Removable Screens in Position Between Posts

Each car is the double end type and has the standard Pay-As-You-Enter arrangement with full vestibules, four section folding doors being provided on the controller side of the car and a single sliding door on the brake shaft or exit side. The folding doors are arranged so that when they are closed a pipe pivoted on the doors extends across them and latches to the corner post. When the doors are open the pipe is held in a vertical position behind the door. The sliding exit

door slides into a pocket which has a hinged window on the inside for easy access to the door mechanism and for cleaning the outside window. The two doors in the end bulkhead both slide towards the center of the car.

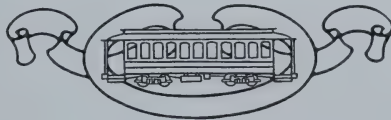
The interior finish of the cars is selected cherry with composition ceiling. There are nine Brill Winner reversible seats on each side of



CARS FOR THE LEHIGH VALLEY TRANSIT COMPANY—The Windows Are Plate Glass and Can Not Be Raised or Lowered

the car and longitudinal seats at the four corners of the car, giving a seating capacity of 44 persons. The seats are upholstered in rattan. The cars have pantasote curtains and push buttons on each post.

Brill No. 27-M. C. B. 1 trucks for high speed service carry the cars. The trucks have a 6-ft. wheel base, 34-in. rolled steel wheels with 3-in. tread and $\frac{3}{4}$ -in. flange and axles 5 in. in diameter. The journals are $4\frac{3}{4}$ by 8 in.



EQUIPMENT FOR GUADALAJARA,
MEXICO

SECOND-CLASS TRAIL CARS

THE Danville Car Company was the builder of ten cars of the type shown in the accompanying engravings for the Compania Hidroelectrica E Irrigadora del Chapala. The cars have the following dimensions:—

Length over bumpers	35 ft. 0 in.
Length over panels	27 ft. 4 in.
Length of platform over bumpers	3 ft. 10 in.
Width over posts	8 ft. 0 in.
Height underside of sill to top of roof	9 ft. 3 in.

As the cars are for second-class service the interior finish is ash of plain design and the ceilings have the carlines showing. The side ceilings have moldings for advertising cards and striped duck curtains are used at the side windows, which are the drop sash type. There are five double seats of ash slat construction, back to back, on each side of the aisle and a stationary seat in each corner, giving in all a seating capacity of 44.

Except for the interior finish the construction of the car is first-



EQUIPMENT FOR GUADALAJARA, MEXICO—The Cars Have Straight Sides With Steel Sheathing and Drop Sash—The Trucks Are Brill No. 57 for Trail Service



EQUIPMENT FOR GUADALAJARA, MEXICO—The Interior Finish With Ash Slat Seats and Striped Duck Curtains Indicates the Second Class Service in Which the Cars Will Be Used

class. The underframing includes yellow pine side- and sub-sills and oak cross sills, all securely tied with $\frac{3}{4}$ -in. rods. The posts are ash and each has both under and upper truss rods. The platform framing is oak including the crownpieces and bumpers. The straight sides of the cars are sheathed on the outside with sheet steel.

The cars are mounted on Brill No. 57 trail trucks which are built for standard gauge track and have 28-in. cast chilled wheels with $2\frac{3}{4}$ -in. tread and $\frac{3}{4}$ -in. flange. They will be operated over track of which the sharpest curve has a radius of 35 ft. The No. 57 Brill truck is one which is extensively used in the United States and abroad for trail service and is frequently referred to as Brill truck No. 420 under which number it was originally known.

CARS FOR THE HOUSTON ELECTRIC COMPANY

PLAIN ARCH ROOF EQUIPMENT

EDITORIAL comment on the merits of the plain arch roof was made in the August number of Brill Magazine and the accompanying engravings show one of the cars on the first order of appreciable size for cars with this construction. Fifteen cars went forward to the Houston Electric Company from the plant of the American Car Company at St. Louis in a single shipment.



CARS FOR THE HOUSTON ELECTRIC COMPANY—The Graceful Arch of the Roof Gives a Pleasing Appearance—The No. 39-E Single Motor Trucks Have a 4 ft. 6 in. Wheel Base

One of the principal objections to the arch roof car has been the appearance, and accordingly photographs of the Houston cars are particularly interesting. It is not believed that either the exterior or interior is of objectionable appearance and doubtless there will be many who will consider the interior more attractive than that of a car with a monitor roof. The question of ventilation is taken care of by sixteen 6-in. ventilators of patented type which can be opened and closed. While the roof is the plain arch type, both platform hoods are detachable. The front platform is of the closed type and supports the platform hood. The rear platform hood is supported by two pipe

stanchions and the hood is fastened to the car body with lag screws and angle irons. Both hoods are of a construction generally similar to that of the roof which has $3\frac{1}{4}$ by $1\frac{1}{2}$ -in. oak carlines shaped to the outline of the roof and strengthened on each pair of posts with $\frac{5}{16}$ by $1\frac{1}{4}$ -in. steel carlines with feet resting on the top of the posts. The roof is covered with $\frac{3}{8}$ by 3-in. yellow poplar and the ceiling is $\frac{1}{4}$ in. composition board placed in sections and molded off with mahogany.



CARS FOR THE HOUSTON ELECTRIC COMPANY—There Are Sixteen Ventilators Which Can Be Closed or Opened—The Interior Finish is Mahogany

The cars are the single-end type and have a full-vestibuled front platform and an open rear platform which is arranged for prepayment operation. The front platform has a single sliding exit door with mutually operating folding step.

The underframing comprises $4\frac{1}{2}$ by $7\frac{3}{4}$ -in. yellow pine side sills reinforced at the bolsters with 6 by $3\frac{1}{2}$ by $\frac{3}{8}$ -in. angle iron 4 ft. long. The cross sills are oak $2\frac{3}{4}$ by 5 in. reinforced with 4 by $\frac{3}{16}$ -in. steel

plate with a 4-in. foot on each end. On the opposite side from the plate there is a $\frac{3}{16}$ by 4 by 6-in. angle iron. There is a $\frac{5}{8}$ -in. tie rod at each cross and end sill. The end sills are made of 4 by $7\frac{3}{4}$ -in. oak reinforced on the inner side with 6 by $\frac{3}{8}$ -in. steel plate with a 12-in. foot on each end. The outside platform knees are made of 6-in. Z-bars. There are 1-in. truss rod under each side sill and inside truss rods made of $\frac{3}{8}$ by $2\frac{1}{2}$ -in. steel.

There are single sash in the window openings which are 34-in. high. The sash are arranged to drop. Three-bar window guards are placed



CARS FOR THE HOUSTON ELECTRIC COMPANY—The Entire Shipment of Fifteen Cars Leaving the Works of the American Car Company at St. Louis

on each side of the car and in accordance with a quite general practice the guards are hung on malleable brackets and arranged to drop in sections so that the windows may be easily cleaned. The interior finish is solid mahogany, the seats are upholstered in rattan, pantasote curtains are provided at the windows and there are push-buttons on each post. Each car, which has a seating capacity for 24 persons, has the following principal dimensions:

Length of car body over corner posts	26 ft. 0 in.
Length of front platform over dashers	5 ft. 0 in.
Length of back platform over dashers	6 ft. 6 in.
Length of car over platform	37 ft. 6 in.
Width over sheathing below windows	8 ft. 5 in.
Height from top of floor to under side of headlining	8 ft. 0 in.

The cars are mounted on Brill No. 39-E single-motor trucks.

BRILL MAGAZINE

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In the interests of The J. G. Brill Company, American Car Company, John Stephenson Company, G. C. Kuhlman Car Company, Wason Manufacturing Company, Danville Car Company, Compagnie J. G. Brill.



THE annual convention of the American Street and Interurban Railway Association and its affiliated organizations will be held at Atlantic City, N. J., from October 10 to 14 inclusive. Already the most comprehensive exhibit of electric railway apparatus ever assembled under one roof is assured and the convention will in all probability be more largely attended than any previous convention. The work of the Association is such that no electric railway can afford not to be represented. To be sure most of the papers which will be read will be printed in the technical press and the principal discussion will also be reported. But by no other means than personal presence can all possible good of the meetings be obtained. No other occasion presents such an opportunity for the study of modern developments in equipment, of devices and methods to increase earning power and solve various prob-

lems, nor such an opportunity to visit with electric railway men from other parts of the country and find out what they are doing under the same circumstances as yours. The electric railway official who stays at home will make a mistake.



AFTER an electric railway has gone through the precarious period following projection and has attained the condition of a new operating electric railway, it, like a human being, is beset with all of the dangers of infant mortality. Some of these dangers are due to unwise or too expensive construction which make it impossible to pay fixed charges and operating expenses. Other dangers arise from the personnel of the management. As was pointed out in a previous editorial in these columns, most electric railways are built for the most part by home money and in many instances the principal officers of the company are prominent business men of the vicinity whose money is to be found in the leading industries. Perhaps one of these men of unquestioned general business ability undertakes the management of the new road, or more probably one of them has a son who attended a neighboring college and studied electric engineering, or there is some promising young man of local raising who has shown more or less talent in the same

direction, to whom the management is given under the advisory supervision of the older men whose money built the road. John Smith, a local product of general mechanical ability, is made master mechanic. The owners of the road have a commendable desire to help their own townspeople and much pride in their ability to themselves swing the whole proposition, including financing, construction and operation. When the end of the year comes and the annual statement is made out there are some surprises. The figures for the number of passengers carried probably don't size up as large as they did in the prospectus and there are some unforeseen expenses in the mechanical and electrical department. Possibly some new motors had to be bought or one of the cars was badly smashed up when the brakes failed to work and the car ran away down hill or smashed into another car. But the things that caused all the trouble are accounted for, a few things are decided on and otherwise things are continued as before. Perhaps the active managers do learn enough by experience to pull things through, but it is quite as apt to be the case that things run along for another year or so showing some improvement, but not enough, and then either the bankers step in and force a reorganization with some experienced practical electric railway men in charge or there is a receivership. Probably most new roads take the latter cure sooner or later. Not

all of them, but still a good many, could be saved by placing the road in the hands of experienced managers at the start, with the local talent as understudies for a few years, if desirable.



MANUFACTURERS, railway men and others who have employed college graduates have had considerable trouble in securing men who demonstrated the abilities or qualities reasonably to be expected from college graduates, and some manufacturers after several experiments with college graduates have condemned the college man *per se*. Frederick W. Taylor in discussing the subject before the Society for the Promotion of Industrial Education pointed out that the central idea that the boy gets at college is training, training of the mind, storing the mind full of things, whereas for success in life mere intellectual training comes second or third. Mr. Taylor claims, and we believe rightly, that without the slightest question character comes first; good sense, second, and intellectual training third. His remedy for the conditions which result in lack of development of the first two qualities is for the young student to leave college at the end of the freshman year and spend at least one year in actual hard work in a shop of some kind, where he is certain to be under

constant supervision. Mr. Taylor says: "I would send them there mainly for the purpose of giving them a real look at life's work and give it to them early enough so as to affect the last three or four years of their college life. When they start work in a shop, under good rigid discipline, they then begin to get the character training, which is almost entirely lacking at college. They then begin to learn the great lesson of life, that almost nine-tenths of the work that every man has to do is monotonous, tiresome and uninteresting. Then they start to develop the character which enables them to do unpleasant, disagreeable things." The University of Cincinnati has endeavored to accomplish the same results which Mr. Taylor hopes to accomplish by his plan, through an arrangement whereby the students spend a portion of each year in actual work in commercial shops under conditions as nearly as possible the same as those of the other employees. Another way which we believe will be used to a greater extent in the future is that of taking young men who have already demonstrated the necessary qualities of character and good sense and sending them to college. These men, who are to be found in every shop of any size, it has been our observation have a keen desire for a college education and a lively sense of its value. They would be able to apply themselves to their college work with special attention to the subjects which refers to the work

they have been doing and propose again to do; their studies have a special significance and meaning with respect to their previous work. We believe that many large industrial concerns and steam and electric railways will in the course of a few years adopt a practice of taking promising young men from their ranks and sending them to college for the purpose of strengthening their organization in a most effective way.



PERHAPS it is premature and visionary to consider the possibility of a transportation system embodying as closely related parts not only the present steam railways and the high speed electric interurban railway, but also the more modest urban electric railways. However, no less a personage than Mr. George Westinghouse sees with apparent clearness the need of immediate attention to the adoption of a universal system of electrification and in his paper read before the recent joint meeting of the American Society of Mechanical Engineers and the Institution of Mechanical Engineers he discusses that subject from the standpoint of heavy electric traction and the electrified steam railways. Possibly Mr. Westinghouse considered that allusions to the future contingency of the smaller electric railways being involved would have a



tendency to weaken the force of his arguments for the adoption of a universal system of electrification. But that the city electric railways are surely going to have increasing occasion to interchange cars with each other and with the steam railways and that the practice is economical and utilitarian is clearly evident from an even cursory examination of properties where such a practice is already in vogue in a preliminary way as on the lines of the Indiana Union Traction or Illinois Traction Systems. On that account it is interesting to note that none of the requirements mentioned by Mr. Westinghouse as necessary for universal electrification would in any way militate against bringing the urban electric railways into the universal system. In fact it is because of the probability of such a condition arising that it will be worth while for every electric railway man to note the requirements and lend his support towards every effort for the adoption of a universal system. The fundamental requirements to insure interchangeability of traffic in steam operation are five: (a) a standard gauge of track; (b) a standard or interchangeable type of coupling; (c) a uniform interchangeable type of brake apparatus; (d) interchangeable heating apparatus; and (e) a uniform system of train signals. Electric operation introduces three further fundamental requirements: (f) a supply of electricity of uniform voltage and periodicity; (g) conductors uni-

formly located with reference to the rails; and (h) uniform apparatus for control of electric supply. Beginning with the first of these requirements, it is apparent that a manager who builds anything but a standard gauge line is in all probability adding a future financial burden. As far as the first requirement from a strictly electrical standpoint is concerned (f) three important systems are in use. These are: (a) the continuous or direct current system (commonly called the "third-rail" system), which employs alternating current for transmitting power when the distance is considerable; (b) the three-phase alternating current system with two over-head trolley wires; and (c) the single-phase alternating-current high-tension system with a single overhead trolley wire. The power-house equipment is essentially the same in the three systems, but the systems differ in the kind of motors and controlling apparatus used and in the methods and apparatus for current transmission. While Mr. Westinghouse does not undertake in his paper to advise the adoption of any one of the systems, it appears from the text and from certain diagrams in Appendix III of his paper that from the standpoint of current loss between generator and locomotive, first cost and operating cost, the single-phase system has the greatest advantages. But as stated before the subject is considered from the standpoint of heavy electric traction only.